

Claims

What is claimed is:

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See 103
[c1] A glass composition comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , 0.0-3.0 mol % BaO , and 0.0-5.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.

[c2] The glass composition of claim 1 having a liquidus temperature of 1100°C or less.

[c3] The glass composition of claim 1 having a viscosity at a liquidus temperature of at least 10^5 poise.

[c4] The glass composition of claim 1 having a viscosity at a liquidus temperature in excess of 4×10^5 poise.

[c5] The glass composition of claim 1 having a linear coefficient of thermal expansion of 80 to $95 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C

[c6] The glass composition of claim 5 having a linear coefficient of thermal expansion of 87 to $92 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C.

[c7] The glass composition of claim 1 having a strain point greater than 580°C.

[c8] The glass composition of claim 7 having a strain point of at least 640°C.

[c9] The glass composition of claim 1 further comprising at least one oxide selected from the group consisting of B_2O_3 , P_2O_5 , Li_2O , Y_2O_3 , La_2O_3 , and ZnO in a total amount not exceeding 5 mol %.

[c10] The glass composition of claim 1 wherein a molar ratio of Na_2O to K_2O is approximately 1.0.

[c11] The glass composition of claim 1 wherein a molar ratio of Na_2O to K_2O is in a range from 1.2 to 3.0.

- [c12]** The glass composition of claim 1 comprising 60-65 mol % SiO_2 , 15.5-17.0 mol % Al_2O_3 , 9.5-11.0 mol % Na_2O , 3.5-5.5 mol % K_2O , 3.5-8.0 mol % CaO , 0.0-2.0 mol % MgO , 0.0-2.0 mol % SrO , 0.0-2.0 mol % BaO , and 0.0-3.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.
- [c13]** The glass composition of claim 1 further comprising at least one oxide selected from the group consisting of B_2O_3 , P_2O_5 , Li_2O , Y_2O_3 , La_2O_3 , and ZnO in a total amount not exceeding 3 mol %.
- [c14]** A glass composition comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , and 0.0-3.0 mol % BaO .
- [c15]** The glass composition of claim 14, wherein $\text{MgO}+\text{SrO}+\text{BaO}$ are present in a total amount of 0-5 mol %.
- [c16]** The glass composition of claim 14, comprising 60-65 mol % SiO_2 , 15.5-17.0 mol % Al_2O_3 , 9.5-11.0 mol % Na_2O , 3.5-5.5 mol % K_2O , 3.5-8.0 mol % CaO , 0.0-2.0 mol % MgO , 0.0-2.0 mol % SrO , and 0.0-2.0 mol % BaO .
- [c17]** The glass composition of claim 16, wherein $\text{MgO}+\text{SrO}+\text{BaO}$ are present in a total amount of 0-3 mol %.
- [c18]** A glass composition comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , 0.0-3.0 mol % BaO , and 0-5 mol % $\text{MgO}+\text{SrO}+\text{BaO}$, the glass composition exhibiting a strain point of at least 640°C and a linear coefficient of thermal expansion of 80 to $95 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C .
- [c19]** The glass composition of claim 18 having a liquidus temperature of 1100°C or less.
- [c20]** The glass composition of claim 18 having a viscosity at a liquidus temperature of at least 10^5 poise.
- [c21]** The glass composition of claim 18 having a viscosity at a liquidus temperature in excess of 4×10^5 poise.

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- [c22] The glass composition of claim 18 comprising 60-65 mol % SiO_2 , 15.5-17.0 mol % Al_2O_3 , 9.5-11.0 mol % Na_2O , 3.5-5.5 mol % K_2O , 3.5-8.0 mol % CaO , 0.0-2.0 mol % MgO , 0.0-2.0 mol % SrO , 0.0-2.0 mol % BaO , and 0.0-3.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.
- [c23] A glass substrate for an electronic display device, comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , 0.0-3.0 mol % BaO , and 0.0-5.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.
- [c24] A glass substrate for an electronic display device, comprising:
a flat, transparent glass exhibiting a strain point of at least 640°C and a linear coefficient of thermal expansion of 80 to $95 \times 10^{-7}/^\circ\text{C}$ over a temperature range of 25 to 300°C , the glass comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-0.3 mol % SrO , 0.0-3.0 mol % BaO , and 0.0-5.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$.
- [c25] A method of producing a glass panel for an electronic device, comprising:
melting a glass batch comprising 59-66 mol % SiO_2 , 14.5-18.0 mol % Al_2O_3 , 8.5-12.0 mol % Na_2O , 2.5-6.5 mol % K_2O , 2.5-9.0 mol % CaO , 0.0-3.0 mol % MgO , 0.0-3.0 mol % SrO , 0.0-3.0 mol % BaO , and 0.0-5.0 mol % $\text{MgO}+\text{SrO}+\text{BaO}$;
and
drawing a thin sheet of molten glass from the melt.
- [c26] The method of claim 25, wherein the glass sheet is drawn by the fusion draw process.

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